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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,997	12/19/2001	Chris R. Franklin	1875.5930000	1881

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EXAMINER

TSAI, SHENG JEN

ART UNIT PAPER NUMBER

2186

DATE MAILED: 07/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Supplemental
Notice of Allowability**

Application No.

10/033,997

Examiner

Sheng-Jen Tsai

Applicant(s)

FRANKLIN ET AL.

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 04/17/2006.
2. ☒ The allowed claim(s) is/are 1,3,4 and 6-13.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

1. This Supplemental Action is taken to correct an error on Applicants' Amendment and Remarks filed on April 17, 2006 regarding application 10/033,997 filed on December 19, 2001.

2. Claims 2 and 5 have been cancelled.

Claim 13 has been amended.

Claims 1, 3-4 and 6-13 are pending under consideration.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

4. Authorization of this Examiner's Amendment was given by Edward J. Kessler (Reg. No. 25,688) on 07/13/2005 over the phone.

The application has been amended as follows:

▪ **Claim 6 is now amended to be:**

"The method of claim 1 ~~5~~, further comprising:

generating parity data for the initialized spare space."

5. ***Response to Amendments and Remarks***

Applicants' amendments and remarks have been fully and carefully considered with examiner's responses detailed below.

Applicants explain the difference between claims 9 and 13, and the objection to claim 13 as being substantially duplicate of claim 9 has been withdrawn.

Allowable Subject Matter

6. Claims 1, 3-4 and 6-13 are allowed.

Reasons for Allowable

7. The following is an Examiner's statement of reasons for allowance:

Independent claims 1, 9 and 12 recite the limitation of "distributing the old data among the set of data disk drives and at least one new disk drive while mapping new data to the spare space of the first array."

It is noted that many references teach the limitation of "distributing the old data among the set of data disk drives and at least one new disk drive" during the expansion of a RAID system.

It is also noted that it is inherent, in the absence of a new disk drive, that new data would have to be mapped to the spare space (if available) of the first array.

However, the Application specifically recites "distributing the old data among the set of data disk drives and at least one new disk drive while mapping new data to the spare space of the first array." That is, any new data to be written into the RAID is only allowed to be allocated to the "spare space" of the set of the original disk drives and is forbidden to be mapped to any space of the newly added disk drives.

This limitation distinguishes these claims from all pertinent prior art based on which claim analysis is performed.

8. The patentability of Applicants' invention was examined and evaluated against the prior art listed below. However, none of them, either alone or in combination with others, teaches all the limitations recited in the claims presented by Applicants.

- Jacobson et al., (US 5,615,352), "Methods for Adding Storage Disks to a Hierarchic Disk Array while Maintaining Data Availability."
- Choy et al., (US 5,758,118), "Methods and Data Storage Devices for RAID Expansion by On-Line Addition of New DASDs."
- Stallmo et al., (US 5,657,468), "Method and Apparatus for Improving Performance in a Redundant Array of Independent Disks."
- Nelson et al., (US 5,666,512), "Disk array Having Hot Spare Resources and methods for Using hot Spare Resources to Store user Data."
- Lyons et al., (US 6,304,941), "Method and Apparatus for Reducing Processor operations when Adding a new Drive to a RAID-6 Drive Group."
- King et al., (US 6,530,004), "Efficient Fault-Tolerant Preservation of Data Integrity During Dynamic RAID Data Migration."
- Burkes et al., (US 5,542,065), "Method for Using Non-Contiguously Reserved Storage Space for Data Migration in a Redundant Hierarchic Data Storage System."

Conclusion

9. Claims 1, 3-4 and 6-13 are allowed as explained above.

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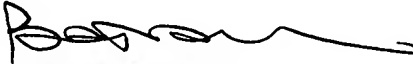
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheng-Jen Tsai whose telephone number is 571-272-4244. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sheng-Jen Tsai
Examiner
Art Unit 2186

July 12, 2006


PIERRE BATAILLE
PRIMARY EXAMINER
7/18/06